

NEW HOST RECORD FOR *ANISOTOMA BASALIS*  
(COLEOPTERA: LEIODIDAE) BREEDING IN  
SPOROCARPS OF THE SLIME MOLD *LYCOGALA*  
*FLAVOFUSCUM* (MYXOMYCETES: LICEALES)<sup>1</sup>

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**ABSTRACT:** Two breeding populations of the primitive staphylinoid beetle *Anisotoma basalis* (Leiodidae: Agathidiini) were found feeding within mature aethalial sporocarps of the uncommon slime mold *Lycogala flavofuscum* (Myxomycetes: Liceales) on the campus of Cornell University, Ithaca, New York, in 1983 and 1989. These discoveries represent the first documented insect association for this myxomycete.

An emerging pattern of host utilization in the agathidiine Leiodidae suggests that many species of these beetles are able to breed on a diverse range of host Myxomycetes (slime molds). Few instances of host specificity are suspected to date. The majority of species have only been associated with mature sporocarps (Blackwell 1984; Lawrence, 1989; Lawrence & Newton, 1980; Newton, 1984; Wheeler, 1979), although a few records exist for both *Anisotoma* (Russell, 1979; Wheeler, 1980) and *Agathidium* (Newton, 1984; Wheeler, 1984a, 1984b, 1987) on plasmodia of host slime molds. Many records involve common myxomycetes that produce large fruiting bodies [e.g., *Fuligo septica* (L.) Wiggers] or dense masses of smaller fruiting bodies [e.g., *Stemonitis fusca* Roth]. The slime mold *Lycogala epidendrum* (L.) Fries, a small, puffball-like species, has also been recorded as an agathidiine host (Lawrence & Newton, 1980; Blackwell, 1984).

Myxomycete host records have been reported by Lawrence & Newton (1980), based on label data, field observations and from published accounts in the North American literature, for eight North American *Anisotoma*, including slime mold species of the genera *Comatrichia*, *Fuligo*, *Lycogala*, *Metatrichia*, *Stemonitis*, *Trichia* and *Tubifera*. Precise information on feeding habits and preferences, and microhabitats of the majority of leiodid beetles is scarce.

In this paper we provide evidence for a new adult and larval host record for *Anisotoma basalis* (LeConte) (Leiodidae: Agathidiini). Two breeding populations of this primitive staphylinoid beetle were found feeding within mature aethalial sporocarps of the uncommon slime mold *Lycogala flavofuscum* (Ehrenb.) Rost. These populations were discovered by one of us (ERH) on two separate occasions, one on a prostrate log and the other on a standing dead tree, along a wooded hillside on the

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Fig. 1. Mature aethelial sporocarp of *Lycogala flavofuscum*. Beetle exit holes through the peridium of the fruiting body are readily visible. Dime indicates scale.

Cornell University campus, Ithaca, New York (Tompkins Co.). These discoveries represent the first documented insect association for this myxomycete.

On 4 June 1983, a large sporocarp of *L. flavofuscum* (approx. 5.1 x 4.6 cm.) (Fig. 1) was found on the surface of a prostrate log (Fig. 2) along a wooded slope on the campus of Cornell University. Within this mature fruiting body a massive population of both larvae and adults of *Anisotoma basalis* was discovered. This population was observed and sampled for more than a week. Because we only partially disturbed the fruiting body, no complete census of the beetles was made. However, more than 200 larvae were collected and slide-mounted, and more than that number were collected into ethanol. We estimate that the total number of adult *A. basalis* was at least 100-200 and that the number of larvae probably exceeded 400-500.

Fig. 2. Microhabitat of the slime mold *Lycogala flavofuscum*. Arrow indicates position of fruiting body (of Fig. 1) on prostrate log.

Fig. 3. Mature aethelial sporocarp of *Lycogala flavofuscum*. An adult *Anisotoma basalis* is visible near exit hole of fruiting body. Scale line = 1.0 cm.



Again on 21 June 1989, several meters from the original 1983 collection site, another smaller sporocarp of *L. flavofuscum* (approx. 2.1 x 2.5 cm.) was discovered on the trunk of a standing, dead basswood tree (*Tilia*), approximately 5 ft. above the ground. It, like the previous sporocarp, had also been penetrated by adult specimens of *A. basalis* (Fig. 3), but no larval specimens were observed.

Both sporocarps are deposited in the Cornell University Insect Collection as voucher specimens of the slime mold.

All three larval instars associated with adult *A. basalis* from this myxomycete host have been described by Wheeler (1990a), as the basis for a study on ontogeny (Wheeler, 1990b).

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### LITERATURE CITED

- Blackwell, M. 1984. Myxomycetes and their arthropod associates, pp. 67-90. In Q. Wheeler and M. Blackwell (eds.), *Fungus-Insect Relationships*. New York: Columbia University Press.
- Lawrence, J. F. 1989. Mycophagy in the Coleoptera: feeding strategies and morphological adaptations, pp. 1-23. In Wilding, N., Collins, N. M., Hammond, P. M., and J. F. Webber (eds.), *Insect-Fungus Interactions*. London: Academic Press.
- Lawrence, J. F. and A. F. Newton, Jr. 1980. Coleoptera associated with fruiting bodies of slime molds (Myxomycetes). *Coleopt. Bull.* 34:129-143.
- Newton, A. F., Jr. 1984. Mycophagy in Staphylinoidea (Coleoptera), pp. 302-353. In Q. Wheeler and M. Blackwell (eds.), *Fungus-Insect Relationships*. New York: Columbia University Press.
- Russell, L. K. 1979. Beetles associated with slime molds (Mycetozoa) in Oregon and California (Coleoptera: Leiodidae, Sphindidae, Lathridiidae). *Pan-Pac. Entomol.* 55:1-9.
- Wheeler, Q. D. 1979. Slime mold beetles of the genus *Anisotoma* (Leiodidae): classification and evolution. *Syst. Entomol.* 4:251-309.
- Wheeler, Q. D. 1980. Studies on Neotropical slime mold/beetle relationships. Part I. Natural history and description of a new species of *Anisotoma* from Panama (Coleoptera: Leiodidae). *Proc. Entomol. Soc. Wash.* 82:493-498.
- Wheeler, Q. D. 1984a. Evolution of slime mold feeding in leiodid beetles, pp. 446-479. In Q. Wheeler and M. Blackwell (eds.), *Fungus-Insect Relationships*. New York: Columbia University Press.
- Wheeler, Q. D. 1984b. Associations of beetles with slime molds: ecological patterns in the Anisotomini (Leiodidae). *Bull. Entomol. Soc. Amer.* 30:14-18.
- Wheeler, Q. D. 1987. A new species of *Agathidium* associated with an "epimycetic" slime mold plasmodium on *Pleurotus* fungi (Coleoptera: Leiodidae); Myxomycetes: Physarales; Basidiomycetes: Tricholomataceae. *Coleopt. Bull.* 41:395-403.
- Wheeler, Q. D. 1990a. Morphology and ontogeny of postembryonic larval *Agathidium* and *Anisotoma* (Coleoptera: Leiodidae). *Amer. Mus. Novitates* (In Press).
- Wheeler, Q. D. 1990b. Ontogeny and character phylogeny. *Cladistics* (In Press).